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GEOGRAPHIC INFLUENCES IN THE DEVELOPMENT OF THE MENHADEN FISHERY ON THE EASTERN COAST OF THE UNITED STATES

By RALPH H. GABRIEL

Yale University

It is the conflict between the land and the adjacent sea that dominates the development of a coast area. In the coastal zone two forces are always at work, usually in opposite directions. If the ocean is productive, a pull is set up which tends to draw the shore dweller away from land and out to sea. If, on the contrary, the country that stretches back from the beach is rich in agricultural or other resources, a counter pull is developed which tends to keep the shore dweller off the ocean and even to draw him inland. Almost every degree of balance and lack of balance is to be found between these two conflicting influences.

There are many cases, however, where the forces of land and water, instead of working in conflict, are actually in harmony. Many times the coast zone and even the hinterland is so unproductive that the man who lives near the shore finds that the land, instead of drawing him away from the water, is steadily pushing him toward it. In contrast to such areas are those where storms, currents, and a forbidding coast line conspire to drive even the most hardy toward the interior. Midway between these two great forces of land and sea, whether they be in conflict or in harmony, lives the shore dweller, his life, to a large extent, the record of the varying fortunes in the eternal struggle between the two dominant forms of the earth's surface.

NEGLECT OF THE MENHADEN IN THE COLONIAL PERIOD

Many an older Long Island resident still lives along the shore of Peconic Bay or Great South Bay who well remembers the time when the menhaden came so frequently to those waters. He can recall the sudden appearance of vast schools of these fish, sometimes hundreds of thousands of them, rushing into the shallow off-shore waters, pursued, perhaps, by some of their voracious enemies, the sharks or the blue fish. The coming of these menhaden, swimming just under the surface of the agitated water, presented a spectacle indeed. From time immemorial these fish have migrated in the months of summer from their winter haunts in southern waters or in the deep sea to cast their spawn in the sheltered coves and inlets of the northern coast. Booth Bay and Cape Ann, Narragansett Bay and Long Island Sound, the Jersey coast, Chesapeake Bay and even Cape Hatteras are the regions to which they have been wont to come. It was in these bays and estuaries that the menhaden fishery began.¹

¹ The standard work on the menhaden fishery for the period it covers is G. Brown Goode: *The Natural and Economical History of the American Menhaden*, Appendix A (=pp. xii + 1-529, with 31 plates, including map of fishing grounds and oil factories, mean scale 1:13,700,000), *Rept. of the Commissioner of Fish and Fisheries for 1877*, Washington, D. C., 1879.

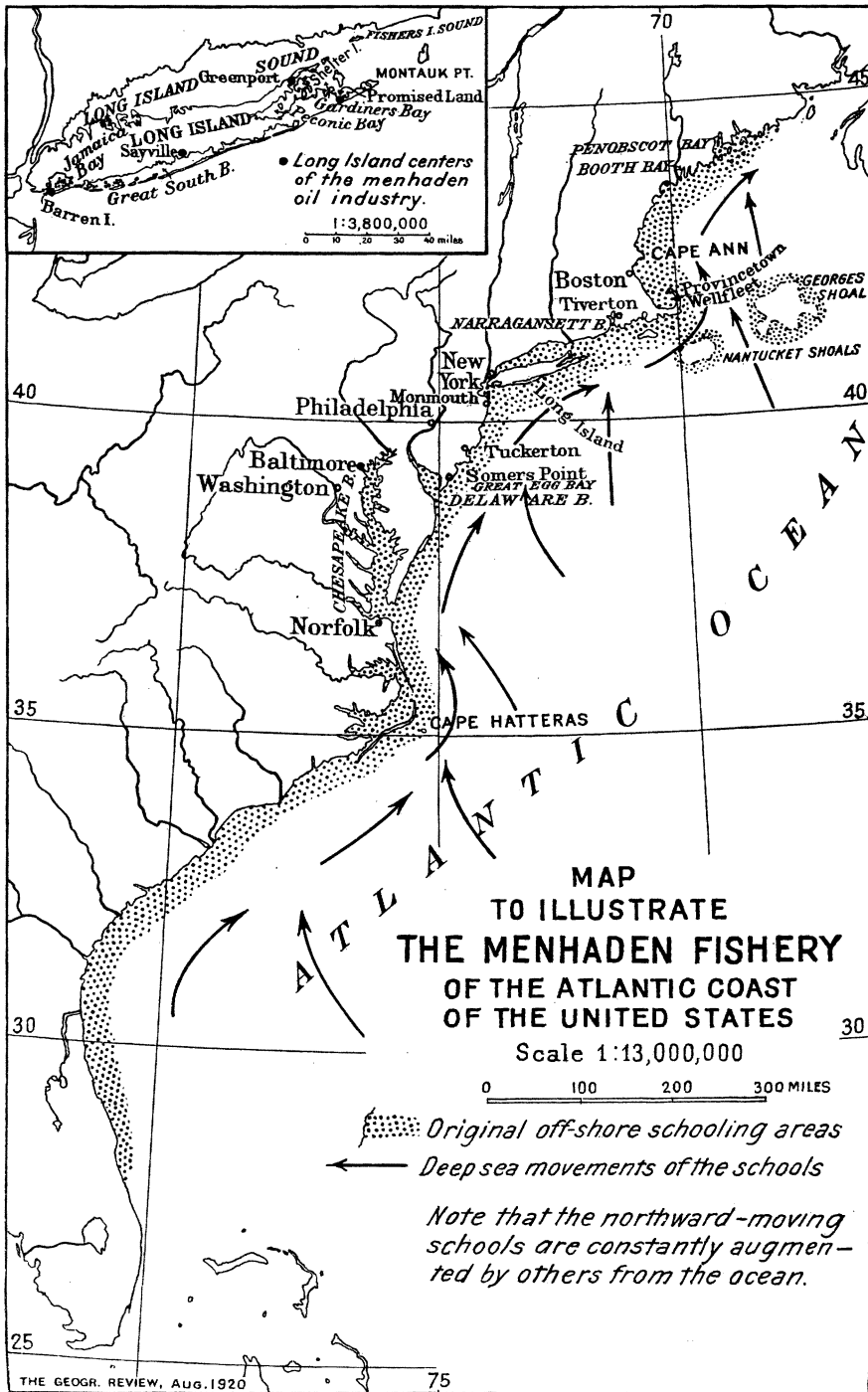
There is a saying among some students of society that man adapts himself to his environment, not so much as it is but as he thinks it is. The traveler among the coast people of New England or Long Island at almost any time during the century and a half of the colonial period would have found a striking illustration of this. To the shores on which these people lived came annually vast schools of menhaden which were allowed to go away again with scarcely a net drawn to catch them. The local fishermen used a few for bait, but there was little more than that. The "mossbunker" was not a food fish and, therefore, was considered valueless. The beginning of the fishery must, on this account, await the time when some important need should arise which the menhaden could satisfy.

DISCOVERY OF VALUE AS FERTILIZER

By the end of the eighteenth century scanty crops and thinning meadows began to tell the story of the exhaustion which had come to the farm lands of New England and the isolated peninsulas of eastern Long Island. Exploitative and unscientific methods of agriculture had borne their inevitable fruit. For a century and more, the means for replenishing the soil had been at hand, unused and apparently but little thought of. In 1801, however, when the damage had been done and the situation had become serious, Ezra L'Hommedieu, a Long Islander and one of the small group of pioneer leaders in the first American movement for better agriculture, published² his conclusions, based on experiments of his own and others, on the possibility of using the menhaden as fertilizer. This was the beginning of new things for Long Island. Three years later President Dwight of Yale College described³ the change that had come over this region. "Their agriculture has within a few years been greatly improved. . . . The inhabitants have swept the Sound and covered their fields with immense shoals of white-fish, with which, in the beginning of summer, its waters are replenished. No manure is so cheap as this where the fish abound." Eight thousand of these menhaden, worth from \$1.00 to \$1.50 a thousand, were required to dress an acre of land. As the farmers awakened to the profits to be derived from the new fertilizer, the fishery grew. Scarcely a year passed without making a new record in the number caught. By the middle of the nineteenth century, the business had reached such proportions that "at least one hundred million" fish were "annually taken for this purpose." It was to rejuvenate a worn-out soil, therefore, that the long neglected "mossbunker" became valuable, and, as a consequence, the menhaden fishery, during its first period of development, was dependent upon the requirements of the new agriculture of the early nineteenth century. Better farming and bigger catches went hand in hand.

² *Trans. New York Soc. for the Promotion of Arts, Agric., and Manfrs.*, Vol. 1, 1801, pp. 65-67.

³ Timothy Dwight: *Travels in New-England and New-York*, 4 vols., London, 1823; reference in Vol. 3, p. 305.



MENHADEN FISHERY DURING THE "AGRICULTURAL" PHASE

The organization of the menhaden business during this "agricultural" phase was a simple one. The first fishermen were, mainly, farmers who organized "companies" to go out in boats to capture the schools when they should appear in the neighboring waters. As the demand increased, however, many of these associations began to devote their whole time, during the fishing season, to the taking of "bunkers." Known by such picturesque names as "Coots," "Fish Hawks," "Eagles," "Pedoodles," or "Water Witches," they began to ply a lively business, and, by 1860, a full score of them were to be found scattered along the shores of Peconic Bay alone. Each "company" owned a huge seine, sometimes fully three quarters of a mile in length. A small board shack on the beach was called "headquarters," and in this the equipment was stored. Upon the sighting of a school the "company" would hastily put off in large, sharp-pointed rowboats and bend to the oars to reach the fish ahead of any rival organization. The menhaden would be quickly surrounded, the net put into the water, and the ends of the great seine brought to the shore in the vicinity of the company's house. Horses, harnessed and waiting at the water's edge, would be quickly hitched to the great ropes of the net, and the fish drawn slowly to the beach, a huge pile of glistening "bunkers," sometimes a hundred thousand or more. Catches were usually large, and the business, with all its uncertainties, seems to have been fairly profitable. Putting away their boats, the "Water Witches" or the "Fish Hawks" would begin immediately counting out the catch, to be sold to the neighboring farmers who flocked to the water at the first news of the haul. When the last "lumber wagon," loaded to overflowing, had jolted away into the interior, the great net would be slowly wound up on a giant reel and left in the sun to dry while the watch again began his lookout for the disturbed water above another school. It was the simple organization of an off-shore fishery. The fish were both caught and used near the beach, and a few fishermen were beginning to risk their whole livelihood in the new and highly uncertain vocation.

DISCOVERY OF VALUE OF MENHADEN FOR PRODUCTION OF OIL

The middle of the nineteenth century brought a change to the menhaden fishery. For some time, a few people interested in the business had been trying with indifferent results to extract oil from the "bunkers" by boiling them in whaler's "try-pots." In 1850, however, Mr. D. D. Wells built near Greenport, Long Island, the first menhaden oil factory on the Atlantic shore. Great success did not immediately attend this venture, for the product was of a dark color and had a very offensive odor. Persistent efforts, however, on the part of Mr. Wells in improving his machinery soon developed an oil that began to come into general use for painting and tanning and for the adulteration of other, more expensive oils. The refuse, "scrap" as it was called, was also utilized. By a process of drying and pulverizing it was made into a fertilizer and distributed among the farmers of the Eastern

States as "guano." The new uses for the menhaden products brought an end to the "agricultural" phase of the fishery. Such inroads were made in his supply that the farmer, finding so many of his fish diverted to other purposes and the "guano" too expensive for universal use, was compelled to bestir himself to a search for other sources whence fertilizer might be derived. The high prices of the Civil War period brought prosperity and also many competitors to the Wells enterprise. Instead of one nearly a score of small "factories" began to consume the catches made by the fishing companies. The oil business, however, was promptly overdone. The resulting elimination of the less fit speedily reduced the number of Long Island enterprises to ten. Built on out-of-the-way stretches of the beach, where their pungent odor would offend as few as possible, these crude establishments, scarcely more ambitious than the "headquarters" of the "Coots" or the "Water Witches," began to employ a considerable number of people and to stimulate the "bringing up of a hardy race of boatmen and sailors." The factory did not at first absorb the older fish companies but attracted new people to the shore. It was the measure of the increasing influence of the sea.

CHANGE FROM OFF-SHORE TO DEEP-SEA FISHERY

By the middle of the nineteenth century another change in the menhaden fishery had begun to manifest itself. Fifty years of uninterrupted capture had made the "mossbunker" wary, and schools came less frequently to the shallow waters of the coast. The catches of the seining companies became fewer and fewer. As a consequence the fishermen began to seek the fish farther out. Sloops and schooners of sometimes twenty tons swept the waters of Gardiner's Bay, Long Island Sound, and beyond. Because the new style of fishing required a new equipment the purse net was developed. When a fishing schooner sighted a school, two open rowboats would put off and swiftly lay the net in a circle about the fish. While the top of this floated at the water's surface, the bottom edge would be quickly "shirred" together with the long ropes intended for that purpose until the "bunkers" found themselves enclosed on every side. The vessel would then tack alongside and, with a scoop net, the catch would be transferred to the great storage tank in the boat. Although some of the old seining companies remained, the day of their importance was passing, and the more energetic among them abandoned the beach for the new style of fishing on the broad ocean. Menhaden fishing, which had called many men to a new occupation at the water's edge, was now steadily drawing many of these out to the open water as the business shifted from an off-shore to a deep-sea fishery.

THE DISAPPEARANCE OF THE INDEPENDENT FISHERMAN

The advent of the oil factory came just at this time of change. The factory, because it was an outgrowth of a fishery already established, sent at first no fleet of its own to sea but was content to buy at its docks the catch of the fishing companies and crews already in the business. In this sense

the first factories were dependent upon the fishermen. To ensure as steady and as large a supply of "bunkers" as possible some owners developed "floating factories," hulls of old ships remodeled and equipped with the requisite apparatus. These could be towed up and down the shore, saving time and expense by following the movements of the fish. The primitive floating factory, an adaptation to the off-shore phase of the fishery, was, however, but temporary. It disappeared with the disappearance of the fishing in shallow water. As the floating factory dropped out, its competitors on the beach grew in size and number. It was inevitable that the owners of these should begin to chafe at their dependence upon the fishermen, over whom they had no control. As the organization of the business required the manufacturers to compete with one another in buying "bunkers" for their presses, it was but natural that the more energetic among them should take steps looking toward the catching of their own fish. Within fifteen years after the founding of Mr. Wells's first establishment, a majority of the oil-making companies were sending their own fleets to sea, with orders to push their prows southward far down the coast and to follow the great menhaden schools in their migration to northern waters. With this change practically came the disappearance of the independent fisherman. He now became one of many elements in an organization steadily growing larger and more complex.

THE "FACTORY" PHASE OF THE FISHERY

During the first three decades of the "factory" phase of the menhaden business a multitude of small oil-making establishments, costing from \$10,000 to \$40,000, appeared along the north Atlantic shore. By 1877 the coast of Maine could boast fourteen factories of sufficient importance to be represented in the Maine Oil and Guano Association. Narragansett Bay supported thirteen concerns, of which nine were located at Tiverton. Farther to the west, five more dotted the Connecticut shore. Another five prosecuted their business on the Jersey coast at Somer's Point and Tuckerton. Four factories were scattered along the Chesapeake from Norfolk to Baltimore. Even at this time, however, when the business reached its greatest regional expansion, Long Island, with its multitude of shallow bays and sheltered harbors, was the most important center. The first ten factories of the pioneers had increased to fifteen on the beaches of the eastern end, with eight more on those of the southern shore. Although, here and there, an isolated plant could be found, the bulk of the Long Island establishments were claimed by three centers, Barren Island in Jamaica Bay, Sayville on Great South Bay, and, most important of all, Greenport and Shelter Island on Peconic Bay.

CHANGE FROM SAILING VESSELS TO STEAMERS

During the period of multiplication of small factories occurred a change which was destined to alter profoundly the development of the industry. The steady decrease of the number of schools coming into the off-shore

waters and the consequent constant lengthening of the voyages down the coast overtaxed the powers of the sailing vessels. The amount of labor required and the speed with which a very perishable product must be brought to the factory from more and more distant fishing grounds were the factors that inexorably marked out the limits of usefulness of the sailing ship. Fish must be brought from grounds scores of miles from the factory and must not be allowed to spoil. The advent of steam was inevitable. The change, however, would cause nothing less than a revolution in the industry. The small oil manufacturer of the seventies could rarely afford to purchase and maintain a menhaden steamer, which, in many cases, would cost more than his entire factory. He usually had neither the capital nor the volume of business to warrant the purchase. The exigencies of deep-sea fishing, however, could not be avoided. The steamer was forced upon him. The result was consolidation of the factories. By 1895 the sailing vessel had been practically driven from the water, and the twenty-three Long Island factories of 1877 had been reduced to eight. Some of these were still located on Barren Island and the rest at a new center, the treeless isthmus of Promised Land. These larger concerns, with their improved equipment and fleets of small steamers, marked the beginning of the phase of the menhaden fishery characterized by highly intelligent adaptation to the peculiarities of the environment. Instead of waiting for the fish to come to the shallow waters of the shore, eager mariners drove their vessels farther and farther to the south whence the northern migration began. Every stretch of water where any menhaden might be found was carefully scanned again and again. The sea had not only drawn the fisherman far out from land but had completely changed his method of work. The movement toward consolidation fostered by the demands of the new deep-sea fishing was, however, not yet completed.

THE CONSOLIDATION OF THE INDUSTRY

On the morning of November 19, 1897, when the people of Greenport picked up their local paper, those interested in the menhaden fishery were dismayed to read the following announcement,⁴ which came without the slightest warning:

A syndicate composed of English capitalists is negotiating for the purchase of the menhaden business at Promised Land. It proposes to buy the factories and the entire outfit, thus securing entire control of the menhaden business on eastern Long Island, and not only does this syndicate hope to obtain control of the Promised Land works, but it has also negotiated for the purchase of the National Oil and Guano Manufacturing Company, which has an office at Maiden Lane, New York, and is regarded as one of the most influential in the business. In fact, it is believed that the syndicate proposes to corner the entire menhaden business of the Atlantic coast. The capitalists have offered the owners of the factories the privilege of selling out their business to the syndicate at a fair price or else run the risk of being frozen out, as they claim this will ultimately come, in due course of time. If the owners of the factories will not sell, the capitalists will then undertake the process of freezing out the individual owners. In

⁴ *The Long Island Traveler*, Nov. 19, 1897.

order to do that they will secure a desirable harbor frontage, in the vicinity of the present factories, and then proceed to business. The capitalists claim to control a patent by which they can manufacture menhaden fertilizer with one third less expense than is incurred according to the present method. In this manner they propose to freeze out the present owners, if they will not sell.

This sudden assault upon the prosperous menhaden business brought consternation to the people. Disquieting rumors ran from village to village along the coast. "Fishermen are asking what the syndicate is. Is it the Standard Oil Company, the sugar trust, or an English syndicate?" Would the Maine and Rhode Island factories sell out? Families whose support depended upon the business became fearful that, in the event of a change, things might not fare well with them. Deep indignation at the cold-blooded attack appeared in every quarter. Behind closed doors the factory owners considered the situation in all its aspects. They understood that they were face to face with a corporation whose capital was reported at ten millions of dollars and which was armed with an invention that would enable it to undersell the most efficient of the local manufacturers. It was intimated to them, that, in the new concern, American as well as British money was involved and that the Standard Oil Company, wishing to turn certain of its waste products into a profitable lubricating grease by the addition of cheap menhaden oil, was the American firm interested. From November until February the owners considered the proposal. On the twenty-fifth of the latter month all the important concerns yielded to the inevitable, and, on that day, was consummated the final transfer of their properties to the American Fisheries Company. Together with those of Long Island went practically all the factories of the Atlantic coast. With this event the movement toward consolidation which had begun far back in the seventies reached its dramatic culmination.

CONCENTRATION OF THE MENHADEN OIL INDUSTRY ON LONG ISLAND

The problem which, at the outset, confronted the American Fisheries Company was of a distinctly geographical nature. Where should the large, new factories of the concern be located? The dominant factor in the problem was the annual migration of the menhaden schools from the warm waters of the Gulf region up the Atlantic coast as far as Maine, a great north-flowing river of fish running roughly parallel to the Gulf Stream. The company decided to establish four oil-making centers from which steamers could be sent out to tap this living stream. Delaware Bay, at the south, Promised Land and Tiverton in the center, and the coast of Maine at the north were the locations chosen. Besides these, an experimental factory was to be established on the Texas coast to try the possibilities of winter fishing in the Gulf of Mexico. Apparently because of its central location and its nearness to New York, Promised Land was chosen for the headquarters of the company. The winter quarters for the fleet were sometimes at Greenport and sometimes at Tiverton across the Sound. The new com-

pany abolished competition. Frequent long voyages, the purpose of which was to outdo rivals, were no longer necessary. The concern arranged its plants so that the river of fish could be divided into three segments, the northern, the middle, and the southern. Factories were located with reference to these divisions. The small factories that had succumbed gave way to large plants, and highly improved steamers brought a greatly increased catch to the storage tanks on shore. It was the last step in intelligent adaptation to the peculiarities of the maritime environment. The only question was whether the supply of menhaden would hold out in the face of such enormous inroads.

The reasons which had led to the concentration of the great menhaden oil business of Long Island into one small locality at Promised Land were significant of certain important developments in the life of the island. In the days of the early oil factories establishments had been scattered at irregular intervals along the whole shore from Greenport to Jamaica Bay to utilize the fish which came to all those waters. By 1890 most of these concerns had moved to Promised Land in the east and Barren Island in the west. After the coming of the American Fisheries Company the Barren Island factories were given up, and the whole Long Island business was carried on at the eastern station. There was another reason for this change, aside from the shifting of the fishery to the deep sea. An exceedingly offensive odor of decaying fish arises inevitably from the menhaden manufacturing establishment. Unpleasant as this was, the factory of the early days, built on an out-of-the-way part of the beach, was allowed to stay because many of the men and women of the locality were dependent upon it for their living. When, however, the summer people of New York began to come to the beaches of Long Island in sufficient number to make them valuable, the situation was changed and a struggle was precipitated between the factory owner and the inn keeper. First to feel the new influence was beautiful Shelter Island, from whose beaches the factories were expelled as early as 1872 by the strong arm of the law, acting avowedly in defense of public health. The story of Shelter Island was that of the whole Long Island coast. Everywhere health officials began closing down or driving out the factories as fast as the local inhabitants entered into the business of caring for the vacation people from the city. The question presented to the factory owner was where to go. Promised Land, a narrow bleak isthmus of sand with the sea pounding at either side, a land of no farms, no villages, and no summer people, offered a safe retreat and refuge. Attractive from its very unattractiveness, set far out upon the Montauk peninsula, near which flows the great menhaden stream, a railroad skirting its beach of sand dunes and finding a terminus a scant hundred miles away in the greatest industrial center in America, Promised Land formed the ideal location for the maker of fish oil. To this center ultimately gravitated the whole of Long Island's great business, and here the American Fisheries Company established headquarters. At least one section of the "Long Island barrens" had come into its own.

CONCLUSION

The menhaden fishery is relatively unknown. It has little of the romance of whaling, and it requires little of the hardihood demanded in the quest for cod off the Newfoundland Banks. There is scant material in this business of the sea with which to stir the imagination, yet the story of the development of this fishery is not without value. The shore line is the greatest boundary line in the world and the coast area the world's greatest zone of transition. Perhaps this story of the development of an obscure fishery which does not consider the sea in its more famous rôles of the great barrier, the busy highway of commerce, or the source of almost limitless food supply will serve to point out the multiplicity of ways in which the ocean influences the life of the shore dweller and the silent power of that influence when once it begins to operate. Most people think of the coast line from the Gulf of Mexico to the Gulf of St. Lawrence as the eastern edge of the United States and fail to realize that it is also the western rim of the Atlantic Ocean. It is the middle zone between the two, typical of neither, and the life of its people is the resultant of the interplay of the two greatest natural forces that the world knows.